



[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 23

[Docket No.FAA-2015-3880; Special Conditions No. 23-271-SC]

Special Conditions: Honda Aircraft Company (Honda) Model HA-420, HondaJet; Cruise Speed Control System.

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Honda Aircraft Company HA-420 airplane. This airplane will have a novel or unusual design feature(s) associated with the use of a cruise speed control system. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: These special conditions are effective **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]** and are applicable on October 26, 2015.

FOR FURTHER INFORMATION CONTACT: Jeff Pretz, Federal Aviation Administration, Small Airplane Directorate, Aircraft Certification Service, 901 Locust, Room 301, Kansas City, MO 64106; telephone (816) 329-3239; facsimile (816) 329-4090.

SUPPLEMENTARY INFORMATION:

Background

On October 11, 2006, Honda Aircraft Company applied for a type certificate for their new Model HA-420. On October 10, 2013, Honda Aircraft Company requested an extension with an effective application date of October 1, 2013. This extension changed the type certification basis to amendment 23-62.

The HA-420 is a four to five passenger (depending on configuration), two crew, lightweight business jet with a 43,000-foot service ceiling and a maximum takeoff weight of 9963 pounds. The airplane is powered by two GE-Honda Aero Engines (GHAE) HF-120 turbofan engines.

The HA-420 airplane will use a cruise speed control system (CSC), which is part of the automatic flight control system (AFCS), to reduce pilot workload during cruise flight only. The intended function is automatic airplane speed control during altitude hold AFCS mode by adjustment of the engine thrust within a narrow authority band utilizing the existing engine synchronization control. The CSC system does not back drive the throttles. The command authority is limited to values used for engine synchronization and can only be engaged when the throttle is positioned in a pre-determined range typically used for cruise power. This significantly reduces the CSC authority such that failure modes of the system should be minor. The proposed CSC system functions in a manner similar to an auto-throttle system, but has significantly less authority when compared to a traditional auto-throttle system.

Type Certification Basis

Under the provisions of 14 CFR 21.17, Honda Aircraft Company must show that the HA-420 meets the applicable provisions of part 23, as amended by amendments 23-1 through 23-62, thereto.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 23) do not contain adequate or appropriate safety standards for the HA-420 because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

In addition to the applicable airworthiness regulations and special conditions, the HA-420 must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36. In addition, the FAA must issue a finding of regulatory adequacy pursuant to § 611 of Public Law 92-574, the "Noise Control Act of 1972."

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type-certification basis under § 21.17(a)(2). Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same or similar novel or unusual design feature, the special conditions would also apply to the other model under § 21.101.

Novel or Unusual Design Features

The HA-420 will incorporate the following novel or unusual design features:

Cruise Speed Control system

Discussion

As defined in the summary section, this airplane makes use of a CSC system, which is a novel design for this type of airplane. The applicable airworthiness regulations do not contain

adequate or appropriate safety standards for this design feature. Mandating additional requirements, developed in part by adapting relevant portions of 14 CFR 25.1329, Automatic pilot systems, applicable to auto-throttle systems along with FAA experience with similar autothrust systems, mitigates the concerns associated with installation of the proposed CSC system.

Discussion of Comments

Notice of proposed special conditions No. 23-15-05-SC for the Honda Aircraft Company model HA-420 airplanes was published in the Federal Register on September 23, 2015 (80 FR 57312). No comments were received; therefore, the special conditions are adopted as proposed.

Applicability

As discussed above, these special conditions are applicable to the HA-420. Should Honda Aircraft Company apply at a later date for a change to the type certificate to include another model on the same type certificate incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

Under standard practice, the effective date of final special conditions would be 30 days after the date of publication in the Federal Register; however, as the certification date for the Honda Aircraft Company model HA-420 airplane is imminent, the FAA finds that good cause exists to make these special conditions effective upon issuance.

Conclusion

This action affects only certain novel or unusual design features on one model of HA-420 airplane. It is not a rule of general applicability and affects only the applicant who applied to the FAA for approval of these features on the airplane.

List of Subjects in 14 CFR Part 23

Aircraft, Aviation safety, Signs and symbols.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 14 CFR 21.16 and 21.17; and 14 CFR 11.38 and 11.19.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Honda Aircraft Company HA-420 airplanes.

1. Cruise Speed Control.

In addition to the requirements of §§ 23.143, Controllability and Maneuverability—General; 23.1309, Equipment, systems, and installations; and 23.1329, Automatic pilot system; auto throttle systems of limited authority that do not back drive the throttles and for which all failure modes are shown to be no greater than minor, the following requirements apply:

(a) Quick disengagement controls for the autothrust functions must be provided for each pilot. Quick disengagement controls must be readily accessible to each pilot while operating the thrust control levers.

(b) The effects of a failure of the system to disengage the autothrust functions when manually commanded by the pilot must be assessed in accordance with the requirements of § 23.1309.

(c) Engagement or switching of the flight guidance system, a mode, or a sensor may not cause the autothrust system to effect a transient response that alters the airplane's flight path any greater than a minor transient, as defined in paragraph (l)(1) of this section.

(d) Under normal conditions, the disengagement of any automatic control function of a flight guidance system may not cause a transient response of the airplane's flight path any greater than a minor transient.

(e) Under rare normal and non-normal conditions, disengagement of any automatic control function of a flight guidance system may not result in a transient any greater than a significant transient, as defined in paragraph (1)(2) of this section.

(f) The function and direction of motion of each command reference control (such as CSC) must be plainly indicated on, or adjacent to, each control, if necessary to prevent inappropriate use or confusion.

(g) Under any condition of flight appropriate to its use, the flight guidance system may not produce hazardous loads on the airplane, nor create hazardous deviations in the flight path. This applies to both fault-free operation and in the event of a malfunction, and assumes that the pilot begins corrective action within a reasonable period of time.

(h) When the flight guidance system is in use, a means must be provided to avoid excursions beyond an acceptable margin from the speed range of the normal flight envelope. If the airplane experiences an excursion outside this range, a means must be provided to prevent the flight guidance system from providing guidance or control to an unsafe speed.

(i) The flight guidance system functions, controls, indications, and alerts must be designed to minimize flightcrew errors and confusion concerning the behavior and operation of the flight guidance system. Means must be provided to indicate the current mode of operation, including any armed modes, transitions, and reversions. Selector switch position is not an acceptable means of indication. The controls and indications must be grouped and presented in a

logical and consistent manner. The indications must be visible to each pilot under all expected lighting conditions.

(j) Following disengagement of the autothrust function, a caution (visual and, unless there are no misleading or hazardous consequences associated with its absence, auditory) must be provided to each pilot.

(k) During autothrust operation, it must be possible for the flightcrew to move the thrust levers without requiring excessive force. The autothrust may not create a potential hazard when the flightcrew applies an override force to the thrust levers.

(l) For purposes of this section, a transient is a disturbance in the control or flight path of the airplane that is not consistent with response to flightcrew inputs or environmental conditions.

(1) A minor transient would not significantly reduce safety margins and would involve flightcrew actions that are well within their capabilities. A minor transient may involve a slight increase in flightcrew workload or some physical discomfort to passengers or cabin crew.

(2) A significant transient may lead to a significant reduction in safety margins, an increase in flightcrew workload, discomfort to the flightcrew, or physical distress to the passengers or cabin crew, possibly including non-fatal injuries. Significant transients do not require, in order to remain within or recover to the normal flight envelope, any of the following:

(i) Exceptional piloting skill, alertness, or strength.

(ii) Forces applied by the pilot which are greater than those specified in

§ 23.143(c).

(iii) Accelerations or attitudes in the airplane that might result in further hazard to secured or non-secured occupants.

Issued in Kansas City, Missouri, on October 26, 2015.

Mel Johnson

Acting Manager, Small Airplane Directorate

Aircraft

Certification

Service

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